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A Thesis on "Contagious Bovine Abortion, and Sterility and its Control, from the point of view of the Country Practitioner."*

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I apologise for bringing forward a subject of such enormous scope and concerning which there is so wide a divergence of opinion, but I selected this as the subject of my essay purely upon these grounds, in the hope of inciting discussion, but relying upon your generosity in the question of criticism, as this is my maiden effort and a very hurried production.

The question of contagious bovine abortion and sterility is one which, in my experience, is constantly before us. I am continually being asked questions relating to it, asked for advice, and being told of remarkable remedies. I believe the question is of universal concern, not merely of local interest. I am not in a position to state actual figures, but I feel sure that I am justified in saying that the question of bovine abortion, if not attacked and dealt with severely in the near future, will be a source of greater inconvenience and loss to the food supply of the world than tuberculosis, foot-and-mouth disease, or any other contagion amongst cattle, which the world has yet had to face. In England, particularly during the last few years, we have been greatly inconvenienced, financially bothered, and scientifically baffled by outbreaks of foot-and-mouth disease, and enormous sums are spent yearly in endeavours to eradicate this scourge.

There has been a great outcry in relation to imported cattle, whether from Ireland or Canada, the home-breeder professing that they spoil his market and so forth, also arguing in his own favour that it is the imported cattle which are responsible for outbreaks of various diseases, in particular foot-and-mouth. Dealing with this latter, just before the war (i.e. in case one forgets 1914), foot-and-mouth disease was practically exotic to England, whereas records for the last two years show an appalling rise. The retort obvious is, stop or curtail the importation. But now we come to the difficulty. The home supply is, and has been, hopelessly inadequate, and more especially now a days, in view of the ravages of foot-and-mouth disease, tuberculosis and contagious abortion. In view of the above observations, it is necessary to urge the discontinuance of the slaughter of young calves and the production of more calves. Foot-and-mouth disease, we trust, the Ministry of Agriculture has now under control; tuberculosis we hope, in view of pressure from the medical and veterinary advisors, Press and the general public, the Government are about to take up. This leaves, then, abortion, the control of which must at present rest with the veterinary profession, with the small assistance of the Contagious Abortion Order of 1921, preventing the exposure for public sale of a cow which has aborted within two months—a very vague and easily evaded Order. It is of the greatest importance, therefore, for the country practitioner to realise the seriousness of the complaint, and to be in a position to advise the breeders of the most satisfactory treatment and method of control.

I have dealt, thus far, entirely with the breeder in relation to the home production of calves, but there is a point which I must of a necessity mention, and that is the loss to the milk supply of the country occasioned by the irregular pregnancy of the cows. I am afraid you will think that I am rambling away from the subject of my paper, but I feel bound to introduce sidelights, such as the following, to bring home the importance of my contentions. In view of the public, personal, and universal demand for a pure milk supply, especially from a tuberculosis point of view, it will be necessary further to curtail the above-mentioned irregular milk supply. Consequently, in my opinion, it is very much more necessary to arrive at a diminution and eventual eradication of contagious abortion and consequent sterility. You will have noticed that I have continually mentioned and, in fact, the denomination of my essay describes, an association between contagious bovine abortion and sterility. This is rather a vague expression to have utilised, and I think I should have explained previously that I refer chiefly to that sterility which is so frequently associated with, or is akin to, abortion. I must leave this question here and refer to it again in its proper place. The question which arises to begin with is the etiology of the contagious bovine abortion. I am not an expert bacteriologist, so I must offer the description of Sir John M'Fadyean and others, and trust that you will take their word for it. Contagious bovine abortion is a specific uterine catarrh due to the *Bacillus abortus* and characterised by the expulsion of the fœtus at any time from the beginning to the normal completion of gestation. The causal organism, the so-called *Bacillus abortus* of Bang (other bacilli have been demonstrated by other bacteriologists, differing only slightly in size and attenuation), varies in size about 1-4 μ in length, and is readily stainable with the common aniline stains, such as methylene

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blue and carbol fuchsin. The larger bacilli sometimes show a granular appearance, somewhat resembling cocci and the smaller ones are usually in clumps. They inhabit the placental discharges, placenta, and uterine cells in large numbers, and may also be found in the blood, mammary glands and milk, and in the liver, blood and alimentary tract of the fœtus. I have frequently, without difficulty, demonstrated their presence in the placental membranes and discharges, but have restricted my research to these. The natural method of infection is by the vagina or by the mouth. *Per vaginam*, the source is most commonly the bull, which, having served an infected cow, has his penis, sheath and prepuce and preputial hairs contaminated with discharges, etc., from the infected cow or contaminated litter. Other sources are contamination of the tail and quarters, from infection in gutters behind the cows. The source of infection by the mouth may be the actual ingestion of discharges, but more readily the contamination of foodstuffs by discharges, etc., from infected cows.

Another method of infection which must not be lost sight of, in view of the fact that the bacilli may be found in the liver, stomach and blood of the fœtus, is that it may be congenital. In relation to the period of gestation, a very important point to be observed is that a cow, although affected with contagious bovine abortion, may carry her calf the full time and calve normally, but the discharges would be swarming with organisms, and constitute a very dangerous source of infection, especially from the fact that she was never suspected. The usual period at which abortion takes place is from the fifth to the seventh month, but it may happen at any time. In experimental cases, the incubative period of 33, 56, and 230 days is recorded. M'Fadyean and Stockman state that in ten cases the average was 126 days. It thus shows that the disease may be in existence for some months during which time no symptoms would be shown and the general health not affected. The premonitory symptoms are very few. In cases where the abortion occurs at a late stage of gestation there are the usual signs of parturition, decreasing in degree down to those of the earliest stages, when the fœtus may be expelled on a pasture or other place, and no symptoms are noticed until the unexpected recurrence of œstrum is the first sign which attracts attention. If the cow is in milk, there will probably be some falling off of the milk, which may be blood-stained and curdled. Immediately before, during and after the act of parturition, a quantity of yellow, tenacious, flocculent discharge is present, which is a discharge from the uterus, and is very highly infected with organisms, contaminating the tail, hind quarters and floor of the cow-shed. This is generally followed by a thin yellow amniotic discharge which discolours the membranes and renders them dropsical or gelatinous, and sometimes there is a thickened yellow purulent discharge, the yellow colour always predominating, but turning to chocolate brown with age, as in the case of mummification.

If the abortion has occurred at an early stage, the placentæ are usually expelled with the fœtus, and the womb quickly closes. I have on several occasions discovered in the vagina a fœtus of about a month old, enclosed in membranes in a partly mummified and partly putrified state, some considerable time (probably one to two months) after the actual act of abortion. In the meantime, there have been no symptoms to attract attention, until one day the attendant observes some after-birth protruding from the vulva and cannot understand it, as the cow had not even calved. In cases which have aborted after the fifth or sixth month, the placentæ are usually retained, and it is important to effect removal as soon as possible, as they are such an enormous source of infection. Also, as they so soon become putrid, there is a grave danger of sepsis, mastitis, metritis and vaginitis, constituting further conditions to be dealt with when considering sterility. In my experience, it is very rare for a cow which has aborted to develop milk fever; in fact, I am not sure, but I do not think I can recall one, and I wonder if any other member can recall a case. This is, of course, beside the point, but it occurred to me at the time of writing. The mere fact of the presence of the actual bacillus not being able to be demonstrated, unfortunately does not in any way prove the absence of the infection; the only method for determining for certain the existence or non-existence of the disease, is by the agglutination test of the blood of cows, which, in the case of freshly-calved cows, should not be taken until two or three days after calving. This, again, I am not in a position to explain, but I am content, or at least have to be content, with the decision of my superiors in that particular department. I feel that here is a suitable place to make known to those members who are not aware of the fact, that the Ministry of Agriculture and the Institute of Animal Pathology, at Cambridge, are prepared to examine, test, and report on (free of charge), samples of blood forwarded to them by members of the profession. I feel sure that each one of us appreciates that this, amongst many other details, shows how much the Ministry of Agriculture and the Institute at Cambridge really try to be of assistance to the country practitioner and help him in his very difficult tasks, especially by way of keeping up-to-date. I think that a short discourse on the method of taking a sample of blood is here indicated. Please do not think that I am trying to make myself out to be comparable with the experts in these matters, but I realise how difficult it is for us, as ordinary country practitioners, to observe all the details and circumstances laid down by the bacteriologists; in fact, I often wonder if they observe them themselves in ordinary cow yards, etc., other than those associated with their own laboratories. Some of us were fortunate enough to witness the experts at Cambridge. To concur with the ordinary text-book principles, it is necessary first to arm oneself with a pair of bulldogs (not those with teeth, but those commonly called "humbugs"—for that reason, I suppose) with which to restrain the cow; an ordinary (which is now almost

extinct) blood cord; a sterile hypodermic needle, and a sterile one ounce bottle and cork. The Institute of Animal Pathology demonstrated the method by pressure on the jugular with the finger, and simple enough it seemed with the trained cow, but one finds it very difficult with the "real" cow, and I strongly advise the blood cord. Also they demonstrated with an hypodermic needle about three or four inches long. There, again, it was fairly simple with the laboratory cow, but dangerous and unsatisfactory with the real cow. I find it very much easier and that there is less likelihood of injuring the opposite wall, or of even transfixation of the jugular, with a needle about one inch to one and a half inches.

The cow is now placed in position. Apply the "humbugs" and bend the head towards the one side or the other, away from the operation; arrange the blood cord as near the base of the neck as possible, draw tight, and raise the jugular vein as in phlebotomy. Keep the bottle for collection of blood in a convenient position, for preference in a pocket of an operating gown, or in a tray held by an assistant, being careful all the while not to expose the bottle to infection. Clip the hair from the seat of operation clean, and dress with tinct. iodine. Insert the hypodermic needle pointing towards the head and allow the stream of blood to pass into the bottle. When sufficient has been drawn off, loose the blood cord and extract the needle, when no further treatment of the seat of operation is necessary. I have detailed this method of operating as I find it easy, practicable and palliative to the client, who often likes to be present on these occasions. Great care should be taken during this procedure, as it is very undesirable, not only from a surgeon's point of view, but also from an hygienic point of view, not to spill more blood than possible. Also, if one sends a sample of blood to a laboratory to be examined and it is covered on the outside with dried blood and finger marks, the bacteriologist immediately loses confidence in the collection, and consequently does not give his decision and assistance with confidence. I have been at laboratories when just such samples have arrived and I have noted the remarks of the bacteriologists. I try to make sure never to let them be applied to me, and I hope and feel sure that you will all do the same. It is so easy to be clean and it creates such a good impression.

Having procured the sample, seal the bottle and label it, and despatch it to the laboratory for diagnosis. In a few days a report will be forthcoming. If the circumstances of the case point, in your opinion, to contagious bovine abortion, whereas the report of the laboratory is negative, continue to send samples from the next two or three abortions, and if all prove negative you can feel sure that this particular outbreak is not the so-called specific contagious bovine abortion. Even in such a case great care should be taken to disinfect and minimise the risk of possible infection.

But, should the report be positive, multitudinous precautions, directions and advices will be necessary, the most important of which, I will endeavour to enumerate under the heading of "Treatment." Probably, in my haste to compile this paper, I have missed some details, but if in the main the principles I give are adhered to profit and gain will be the reward.

Sterility.

The most alarming sequel, almost as bad as abortion itself, is sterility. It is here that I propose to treat with sterility, or "running to bull," into which I do not intend to go at length, but purely from that angle at which, in my opinion, it is associated with abortion.

There are various causes of sterility in relation to my subject, the most important being infection with the bacillus of contagious bovine abortion. As mentioned before, the condition of abortion is a catarrh of the uterus and consequently must be regarded almost as much responsible for sterility as the actual abortion. This may occur in maiden heifers and it was for that reason that I mentioned previously the possibility of congenital infection or infection at birth. I had, about twelve months ago, a lot of about twenty-six heifers, twenty-two of which would not hold the bull. Except for a period immediately after birth, these were never exposed to infection, and evidence which I will give later, when considering treatment, I think confirms my suspicions of probable congenital, or at any rate, very early infection.

Also, when infection has taken place at later stages and abortion has occurred, it still may leave behind at least the catarrh, if not other conditions, associated with it or entirely separate.

In my opinion, the next cause of sterility associated generally with abortion, and vieing with it for first place in importance, is the so-called contagious granular vaginitis, which is a sub-acute vaginitis characterised by small granular vesicles, the contents of which are usually a pure culture of streptococci and staphylococci. There may be nothing much to observe clinically in the course of the condition beyond returning to bull. However, the condition may take on a more acute course, in which there would be erection of the clitoris with frequent micturitions, even nymphomania and some considerable discharges; but, in my opinion, this is not usual, or at least not so pronounced as in the closely allied, but, as I believe, quite distinct coital exanthema, or "bull burn," to be referred to later. The sub-acute form is more often then only discovered by especial examination, which can be done in some instances by merely parting the lips of the vulva or inserting a speculum and examining the whole of the interior with the aid of an electric torch. Beside the granular appearance, there is usually a streaky form of congestion of the walls of the vagina, and the application of litmus paper indicates an acid reaction, which helps considerably to account for the sterility. Another method of examination of the condition of the os and mucous membrane of the vagina is by means of retracting the os uteri, by grasping the cervix with a pair of special forceps, and an examination *extra vulvaris*—an extremely efficient and satisfactory method, which can be enlarged and

discoursed upon by, amongst others, our learned friend, Mr. T. G. Heatley, who will, I feel sure, explain the usages and advantages in a much more able manner than myself. This method will, I am confident, become the most popular, but involves the purchase of expensive instruments, and is really of much more service in the manipulation of the os in cases of malformation, as for artificial insemination, or those conditions necessitating insertion of instruments through the closed os.

This condition of vaginitis is communicable to the bull in the form of a slight granular inflammation of the penis and sheath, which, although causing little trouble to the bull, is a very great source of infection to other cows.

That form of vaginitis referred to as coital exanthema, or "bull burn," is a vesicular inflammation passing to pustular and then to ulcerative, with copious discharge, and, in the cow, swelling of the labiæ, erection of the clitoris, frequent straining and stamping with the hind feet, obvious pain during and after micturition; some rise in temperature, usually 1—2°, constipation, and some interference with appetite. In the bull, in addition to the above, there is a copious urethral discharge and balanitis. I quote the above chiefly as a differentiation from the granular vaginitis, but of course it must be considered a cause of sterility whilst it lists, but is not so easily overlooked. Sometimes, whilst examining a smear from the vagina, a vibrio (or common or S-shaped organism) may be demonstrated, which is quite capable of producing abortion and sterility, but which need not be considered with so much alarm as the preceding conditions, and is fairly easily destroyed by treatment. I am not sufficiently familiar with this condition to elaborate on it, but hope there is some member who can and will enlighten us on the subject. Of course the ordinary chronic catarrh of the womb, or "whites," and the simple forms of vaginitis, can be associated with contagious abortion, but it is, to my mind, such an obvious cause of sterility, that I leave discussion of these in favour of the more obscure causes.

There are many other causes of sterility, such as malformation of cervix and os, malformation of male genital organs, diseases of ovaries and testicles, and other conditions which I do not propose to discuss, as it is the foregoing which I consider to be most commonly associated with contagious abortion, and especially as I hope to leave plenty of time for members to raise points for discussion.

Treatment.

I propose now to deal with the treatment, a part which, I feel sure, will meet with much criticism and produce further suggestions which I hope will be of mutual benefit. By far the most important measure to be taken is prevention, which, unfortunately, is often overlooked, and no opportunity is given for the veterinary surgeon to advise, as, when first appealed to, it is after the infection has taken place. But advice should always be given to farmers and cow-keepers to keep all fresh cows isolated from the rest of the herd until they are satisfied that these have not come from an infected herd and are not themselves infected. I realise full well that, though text-books and literature in general make such a strong point of this, it is quite impossible, except with unlimited capital and accommodation, for farmers to comply with their recommendations. But a simpler, and, I think, comparatively safe and practicable method is, firstly, not to buy cows in a public auction unless there is a guarantee of freedom from contagious bovine abortion, and, secondly, not to buy cows in a private auction or by private treaty unless assured that there has not been exposure to infection. Assuming them to have been purchased as in-calf, keep them isolated until, having calved after the normal period of gestation, they show no symptoms of being infected with contagious bovine abortion, and then only allow them to associate with the rest of the herd after all normal discharges have ceased, making doubly sure by two or three irrigations of the genital tract with an antiseptic solution such as chinosol, about 25 grains to the quart; hyd. perchlor 1—3000; pot. permang. 1—1200, or some other of the many well-known antiseptics, but I consider one of the above mentioned to be preferable. The hind quarters and tail should be washed with a disinfectant such as Jeyes' or Lysol (or other suitable drug or proprietory article), and general hygienic methods must necessarily be adopted to ensure a clean and pure milk supply. These precautions will not only greatly diminish the risk of the spread of infection of contagious bovine abortion, but will be a great factor in preventing the occurrence of the various ailments, mentioned previously, as being responsible for the sterility, and are strongly to be recommended where practicable, even in non-suspicious cases, as a general practice. In these latter instances a gentle douching of the vagina will suffice, or the insertion of an antiseptic pessary containing salol, boracic acid, or iodoform, the first-named in my opinion for preference, although there are many others no doubt of equal reliability. Being satisfied that cleanliness and freedom from disease exists, the cows may then join the others, and one proceeds in the normal way until the time of œstrum approaches, when it is necessary to be satisfied that none of the contagious causes of sterility exists. All my recommendations seem to constitute an enormous amount of extra work after the comparatively slovenly proceedings which have existed in many herds in the past, but when adopted as a general proceeding, usually work quite smoothly. I do not wish to state that all the above must be done by the veterinary surgeon, but by an experienced attendant on the advice of the veterinary surgeon (unless, of course, there is the slightest cause for doubt, when it is essential that his direct services should be sought) as the expense would be so great, except in some cases, as to make it impracticable.

With regard to the purchase of cows freshly calved, it is necessary to isolate them for a week or so to make sure there is no evidence of infection, such as discharges, when the preceding precautions should be adopted on admitting to the herd.

Up to the present I have dealt only with cows, but the introduction of fresh heifers must be equally carefully observed, firstly, with regard to their exposure to infection, and particularly to freedom from lesions indicative of contagious sterility. If the freedom from infection cannot be satisfactorily arrived at, I advise the blood test to be adopted.

Another factor often overlooked, but which requires careful investigation, is the introduction of a fresh bull. Of course he cannot himself abort, but he is a very able and accomplished carrier. Consequently great care should be exercised in ascertaining the condition of the herd from which he was obtained, and a primary disinfection of his genital organs should be adopted. It is especially desirable not to use the same bull on known or doubtfully-infected cows, or to use one hired out to service to all and sundry, as the bull should only be used on known healthy cows. If these precautions are not observed infection is certain to arise sooner or later, but if they are, the risk of infection of a previously healthy herd will be greatly diminished, provided that all reasonable care be taken in the general disinfection of cow sheds, and hygienic conditions be established, especially in regard to the disinfection and cleanliness of the assistants.

Preventive Inoculation.

I now propose to introduce the question of preventive inoculation, and it is in this matter that I expect the greatest controversy. I base my remarks absolutely and solely on personal experience. I have not had the time to dissect from my records actual figures, but I beg of you to accept my statements without prejudice, and with my assurance that they are not prevarications or exaggerations, but as correct representations, as far as general statements can be. From that, I presume that you realise I am a great believer in this inoculation, and would try to convince my confrères of my sincerity. I have read, and listened to, condemnations of it, but from my own experience I support Professor Buxton's remarks in relation to the intradermal tests for glanders and tuberculosis, that, "They are as reliable as the operator." My experience is based upon, apart from small isolated cases, gaining control of serious outbreaks and almost completely eradicating the disease from eleven large herds. This has been the limit of my endeavours. The inoculation for contagious bovine abortion consists of a vaccination with live bacilli of abortion suspended in boullion, supplied in my instance from the laboratory of the Ministry of Agriculture. My recommendations of its use have, in some quarters, been met with various objections. One of course is that, "it is of no use"—the assertion of an obvious disbeliever in probably all vaccinations and inoculations, which, we must admit, is rather out-dated. Another is that cows do badly after it. My experience is that I have never had a case, to which I could accuse, even to myself, the vaccine of being detrimental. I have no doubt that the choice of an unsuitable seat of inoculation, as one seriously exposed to contamination (such as the dewlap or brisket) could be responsible for disorders, as would the use of a dirty needle or syringe, and general disregard of asepsis. I should have mentioned before that I advocate only the inoculation of non-pregnant cows or heifers, as, in my opinion, the inoculation of pregnant cows would possibly cause them to abort, and that, of course, would be undesirable. It is true that just for one day afterwards there may be a slight diminution of the milk supply to the extent of, perhaps, a pint or two, or even to the extent of one gallon for the day. But this, rather than being a distressful sign, points to systematic reaction, which is very favourable for prognosis, and it only lasts as a rule for twenty-four hours.

The other chief objection offered is that it causes sterility. My experience is that this most decidedly is not so, but that sterility was in existence before the inoculation, quite distinct from the actual contagious abortion, and I have the assurance of the Ministryof Agriculture, that, whilst not holding themselves responsible for the use of the vaccine, they have no reason to suspect any harmful results if used in an efficient or careful manner, and that the vaccine itself will not produce harmful symptoms.

I would like at this juncture, to point out that in a great many instances where abortion has existed, coupled with repeated running to the bull, and showing signs of slight vaginitis, after inoculation pregnancy has occurred at the next service, one particular instance being the twenty-two heifers out of a lot of twenty-six previously referred to, and only one aborting, and that about two weeks before its time—a point not confirming the theory of the production of sterility. In another case, in one herd, where there were four cows which had been running over continually and which were considered absolutely sterile, after inoculation all conceived from their first service. Please do not conclude that I infer that cows inoculated will not run over, but merely that the inoculation is not responsible.

The site of inoculation I always employ is on the side of the neck in front of the shoulder, and, after having wiped the site with tinct. of iodine, I inject 50 c.c. subcutaneously. I have never seen any harmful results save, very occasionally, a small abscess at the seat of inoculation, which does not even call for treatment. It is caused probably by the introduction of a particle of dirt from the skin. It is necessary that the cow should not be served for two months after the inoculation, and when all reaction has ceased and immunity established, and the organism eliminated (*vide* M. of A.). If contagious abortion is discovered in a herd I strongly advise, to prevent spreading and as a possible and probable cure, the inoculation of fresh non-pregnant heifers or cows, and every other cow as soon after calving as is practicable, until all cows in the herd have been inoculated. I feel sure that I am justified when I state that, when coupled with other-mentioned disinfection precautions, success will be met with in 90 per cent. of cases, 6 per cent. will be successful on the second inoculation, the odd 4 per cent. proving chronic or not responsive to the

vaccination. I wish to emphasise the local treatment of the vagina and womb in affected cows immediately after aborting or calving, by irrigation with an antiseptic solution, the one which I have found most successful being hydrarg. perchlor. 1—3,000. But this is not advisable as an external disinfectant, bringing to mind a question in Materia Medica put to me by an examiner; "Why should you not use perchlor. of mercury to disinfect a cowshed, etc., after the spilling of the blood, etc.? Because he was Scotch, I thought I was well in by saying that it was too expensive, but he was annoyed and said, "Don't you know it coagulates albumen."

I make a very special point of this local treatment for a treble reason—it so largely prevents the occurrence of symptoms likely to be responsible for sterility, prevents dangers likely to occur in absorption of toxins, etc., resultant from irregular parturition, and prevents the risk of the spread of infection. If a cow should abort in the actual cowshed, she should be removed at once, and all discharges, litter, etc., burnt, and a thorough disinfection made of these cowsheds—floors, walls, partitions, etc. Passing on to the treatment of the various forms of sterility which I have mentioned, I need only add that the irrigations and antiseptic pessaries previously mentioned usually suffice, but, in addition, I advise that the vagina be well swabbed out at the time of irrigation to assist in cleansing the walls and roof, and in the case of granular vaginitis, this ruptures the vesicles, causing direct contact between the raw surface, alive with organisms, and the antiseptic.

Further, in the case of granular vaginitis, if a swab be taken from the vagina and forwarded to the laboratory, cultures will be grown and an autogenous vaccine prepared which will give satisfying results. I have used a stock vaccine prepared by Messrs. Parke, Davis and Co., which is a mixed streptostaphylococcus bacterin. This, I believe, has given good results, but I cannot state this for certain, as I have never tried it alone without the local treatment.

With regard to the chronic form of metritis or "whites," the most satisfactory treatment up to the present, I understand, constitutes the manipulating of the os with the special forceps previously referred to, and the injection into each horn of the uterus of the lugol solution of iodine (150 to 200 c.c.), demonstrated by Professor Folmer Neilsen, of Copenhagen, at the National V.M.A. Congress (see page 835, *Veterinary Record*, 4th October, 1924). Professor Neilsen states that in probably about 50 per cent. of the cases one injection will effect a cure. In the remaining cases two or three injections are required at intervals of about one month or more, because it is generally desirable, in the lightest cases of metritis, to await the effect of the single treatment, *i.e.*, to let the cow be served.

Many treatments for abortion and the prevention of abortion have been advised, such as the sprinkling of the food with a mixture containing iodine, potassium iodid and carbolic acid, the administration of carbolic acid in oil to the cows, and various other remedies which I have no doubt members are well acquainted, even to the extent of the use of Yadil. In my opinion, it is inconceivable that the administration of medicinal doses of antiseptics, etc., can be of sufficient strength, when diluted in the food, or after absorption into the system to be of any material benefit in the destruction of the organism or the control of the disease. The inefficiency of these treatments has, I believe, been proven, although I must admit that, taking into consideration that the possible source of infection is by the mouth, disinfection of the food could be of some benefit if it were possible to give sufficiently large doses. But, unfortunately, if the solution is sufficiently strong satisfactorily to disinfect the food, it is improbable that the animal would eat it, or, if it did, digestive disturbances might be produced.

Discussion.

Mr. Low, who opened the discussion, said that when he sent a blood sample to the Ministry of Agriculture for examination he was informed it was not advisable to take a sample till the cow had aborted fourteen days. Mr. Shipley had said he took it three days after. With regard to sterility following inoculation, he went to a place where he saw twenty cows tied up to fat because they could not be got into calf after inoculation, though they had been running so many times with the bull. There were also several heifers with which the same difficulty was experienced after vaccination. He would also like to know what doses were given of poisons like carbolic acid and iodine, without causing ill-effects to the cow.

Mr. Turner remarked that he did not follow Mr. Shipley's case of the twenty-six heifers that were sterile, of which twenty-two proved fertile after inoculation. Was sterility due to the bacillus? He did not understand his argument about not using perchloride of mercury on the floors of cowsheds, because it coagulated the albumen in the blood. He thought that was the manner in which all disinfectants acted.

The President said Mr. Shipley had very rightly laid great stress on disinfection as part of the treatment. While he had used injections of living bacilli, he had also paid great attention to disinfecting cowsheds, and taken very great care in that direction. It was very difficult, when both these measures were taken, to say to what were due the good results cited by Mr. Shipley.

Mr. Heatley said he did not know whether Mr. Shipley had read Professor Williams' work on Diseases of Genital Organs of Cattle. It would pay all the members to purchase this book and study it closely. Professor Williams had done more work of this sort than any man whose works he had had the privilege of reading. The main points of Mr. Shipley's paper were in opposition to what Professor Williams had written. It was not for him, therefore, to criticise Mr. Shipley, who was following out the advice given by the Board of Agriculture, whose work Professor Williams deprecated in very strong terms. Anyone who read Professor Williams' work would look at the

subject from more than one point of view. Country practitioners who were not present at the demonstration by Professor Neilson at the "National" Congress missed a great treat. He was of opinion that they met with many cases of abortion not due to one cause. He had often tested the blood for the satisfaction of his client. The particular thing was to get the uterus into a healthy condition after abortion, whatever might be the organism setting up an inflammatory condition of the womb, because unless that was set right, sterility would probably ensue. In Denmark, where operations were carried on communally, a veterinary surgeon was attached to a group of farms. No cow was allowed to be served until examined and passed as free from genital disease by the veterinary surgeon. He did not think any community would make such an arrangement unless it had some considerable amount of disease. He knew a herd of cows of one breed in which every cow after calving had to be treated or she had leucorrhea showing in nine or ten days. The speaker remarked to the cowman that that must have been going on for some time because they had had to get rid of cows, owing to "whites," and the cowman told him it had been going on for ten years. He had not himself attended them before. After four treatments a cow became all right, and after being given a spell came in calf. In the case of the sterile heifers mentioned by Mr. Shipley, after being inoculated, when they were left for two months, the genital organs had a good rest and nature could accomplish a great deal. In venereal diseases, copulation brought on exacerbation of symptoms. He did not know what to say about granular vaginitis, which could be found in heifers. It was probably a demonstration of disease situated higher up the genital passage. He had had to do a lot of that work during the past two years, but it was a dirty job for which one needed to go properly clothed. He had noticed at meetings of divisions, where they had been fixing a scale of fees, a certain fee was put down for the removal of the after-birth of a cow at a ridiculously low figure. Mr. Shipley advised them to get it away as soon as they could. He did not think it so easy as some people made out. If they got metritis, the retention of the after-birth was an indication of previous metritis. The os was closed and it was impossilbe to get the hand in. If they tried in the early stages, they might leave some dead membrane behind that acted as a source of infection. If, with ordinary attention, the after-birth could not be removed, he used pessaries of charcoal until separation took place, but the uterus must be irrigated and treated afterwards. It was a great display of ignorance to put down a definite figure of 15/- or 21/- for the removal of after-birth from a cow as if it was a small business or a simple matter, like removing after-birth from a mare. The retention of after-birth by a cow was most serious and they could not put down a nominal fee for its removal, since after-treatment was essential.

Mr. HEATLEY then exhibited for inspection a case of instruments and appliances he used in dealing with cows. He said they were made by Sharp and Smith, of Chicago, and he always took with him a pair of gum boots, an apron made from an old ground sheet, a rubber coat (supplied by Professor Neilsen), long forceps which gripped the uterus, a two-way catheter, Arnold's bladder catheter, forceps for swabbing inside the cervix, vaginal dilator that enabled one to see pus coming from the os, cervix dilator, ordinary douche can with tube, long bull catheter to swab material from uterus, motor grease pump for introducing thick solution into uterus, and electric torch. It needed very nice manipulative skill to use these instruments, because it took very little to get through the tissues of the uterus and then rupture of the uterus occurred. Time and patience were also required. Any lugol solution left in the uterus must be siphoned out. It was a tremendous help to study the position of the organs in a dead animal, but the more he knew the more he realised how much more there was to learn. He was trying to overcome metritis to deal with sterility.

Mr. SHIPLEY thanked Mr. Heatley for bringing his instruments on his request. The branch of work represented, however, came outside the scope of the ordinary country practitioner, and must be left in the hands of specialists like Mr. Heatley. He was disappointed to hear Mr. Heatley term his methods of treating contagious abortion a scandal. He failed to see the evidence for it because the cases he had quoted were remarkable successes.

Mr. HEATLEY replied that he only quoted Professor Williams, who said that the injection of live bacilli was almost a scandal. He had tried to get rid of contagious abortion in a herd, using the blood test, and isolating infected animals, but it was useless. He had vaccinated non-pregnant cows with Board of Agriculture vaccine with very great success.

Mr. SHIPLEY replying, said abortion might not be due to the bacillus of Bang at all. In reply to Mr. Low, he could say that he always took the blood test after three or four days. When the Board of Agriculture told Mr. Low not to take it for fourteen days that was possibly for control, as nothing could be found at first. Mr. Low mentioned twenty heifers or cows tied up to be fatted because they were sterile after inoculation, and it was suggested that inoculation might be responsible for the sterility, but sterility might have absolutely no connection with contagious abortion and probably was in existence before the inoculation. Many cases of sterility might be congenital or of early infection, and have nothing to do with vaccination at all. Mr. Turner could not understand his argument about twenty-two heifers which were sterile until after treatment with vaccine, when they came in calf. One of the causes of sterility was the *Bacillus abortus*, but his advice was to inoculate all cows, because it was a possible or probable cure. He gave a further dose after two abortions when, perhaps, the animal acquired immunity. Perchloride of mercury formed a skin on the top of the blood, and organisms lived and thrived underneath it.

(Continued at foot of first column next page.)

Anærobic Infections in Animals.*

By S. H. Gaiger, F.R.C.V.S.,
Director, Animal Diseases Research Association Laboratory.

This paper is an attempt to describe recent ideas amongst research workers regarding certain anærobic infections in animals, mainly for the benefit of the general veterinary practitioner.

Prior to the late war our knowledge of the pathogenic anærobes was in a state of seemingly hopeless confusion. This confusion dates back a number of years, to the time when Pasteur inoculated guinea-pigs with blood from a cow which had been dead for three days, and a horse which had been dead for one day, and described the organism which killed the guinea-pigs as the Vibrion septique. Koch, who inoculated garden earth into animals and studied the resulting infection, attacked Pasteur's work, and accused him of working with mixed infections. Koch's work was masterly, and his difference of opinion with Pasteur was undoubtedly due to the fact that they worked with different organisms, but there is little reason to doubt that each worked with pure cultures. The organism which Koch then described as Bacillus œdematis maligni is very probably what is now known as B. œdematiens, and that which Pasteur described continues to be known under the name he gave it—the Vibrion septique. From that period till the period of the late war the records of work upon the pathogenic anærobes are, in the main, confusing, due almost entirely to a failure to realise the necessity of ensuring purity in the cultures being studied. The confusion is mainly attributable to German workers, and became greater from their publications upon the bacterial flora of war wounds. Grassberger and Schattenfroh[1] arrived at the conclusion that anærobes can change their nature. They describe one species as the cause of gas gangrene and to this species they give the characters of all other anærobes mixed up together. Sittler[2] holds the belief that the B. chauvœi becomes transformed by its environment into an organism with other characteristics, and Rosenthal[3] holds that B. welchii becomes changed by environment into the Micrococcus ovalis.

It fell to British and French bacteriologists during the war to bring order out of chaos, to show that conflicting views with regard to well-known types were due to working with impure cultures, and to bring to notice several undiscovered species. This pre-war failure to recognise impure cultures as such was undoubtedly almost the sole cause of the confusion, since suitable technique for the study of anærobes has been known for very many years, and the meat and brain mediums so commonly in use nowadays in the study of these bacteria were introduced by Von Hibler as early as 1908[30].

The penetrating wounds of the war in which bits of projectiles penetrated deep into the tissues carrying in pieces of clothing contaminated with the well-manured soil of cultivated land necessitated a thorough study and understanding of the soil anærobes, for it was these, along with the better known ærobic bacteria, which had to be contended with in septic wounds. The study of the anærobes found in war wounds, and particularly the bacterial flora of cases of gas gangrene by British and French scientists, is really the basis of our present clear understanding of these organisms. The literature upon the subject is very vast at the present time, but one does not find as much reference to it as one might expect in veterinary publications.

Till the war period the belief was commonly held that all lesions of the well-known blackquarter type were due to the B. chauvœi, and that a slide preparation from such a lesion, showing "tennis-racquet forms," "spectacle forms," "clostridial forms," and involution forms of bacilli was diagnostic of a B. chauvœi infection. Long, deeply-staining, unevenly-segmented bacterial filaments were accepted as "malignant œdema bacilli," or more generally designated "putrefactive bacteria," and dismissed from the mind as having no etiological significance. Almost any student of veterinary science would have readily undertaken to tell the so-called "malignant œdema bacillus" (i.e., the present-day Vibrion septique) from the bacilli found in a blackquarter lesion upon morphological grounds alone. Despite these general ideas, these two organisms were known in pre-war days to resemble each other very greatly, so much so that even some well-known bacteriologists declared them to be identical, and some of the pre-war accounts of the blackquarter bacillus as isolated and studied from blackquarter lesions can now be easily recognised as not descriptions of the B. chauvœi, but of the Vibrion septique. Here, then, is one conception of anærobic organisms which is of interest to us veterinarians, and which has to be discarded, and we must accept the fact that a blackquarter lesion is as likely to be caused by the Vibrion septique as by the B. chauvœi. Another conception which must be altered is that in which the "malignant œdema type" of bacilli are all lumped together and dismissed as "putrefactive bacteria." The term "malignant œdema bacillus" has been discarded in favour of "vibrion septique," and a distinction must be drawn between the "pathogenic anærobes" and the "putrefactive bacteria." By putrefaction we most of us know what is meant: a breaking up of the dead tissues with the production of a fœtid smell, a proteolysis—in fact, a solution of proteins. We now

(*Continued from previous page.*)

Col. Wood, although agreeing with vaccination, seemed to doubt whether the results obtained were due to vaccination or disinfection and thought that one without the other was of no use. The twenty-two heifers to which he kept referring were simply inoculated, left, and served after two months. The giving of two months' rest was a good point.

*Presented at the N.V.M.A. Annual Congress, Aberdeen, 1924.

know that the pathogenic anærobes are, for the most part, and speaking generally, non-proteolytic, and that the more proteolytic an organism is found to be the less is it pathogenic, that is to say, the more an organism is found to have the power of growing in and breaking up dead tissue the less power has it of growing in and damaging living tissues by its growth there. It also seems to hold good that the more powerful toxin an anærobe possesses, the less its power of invasion of the living tissues, as in the case of the B. tetanus and B. botulinus. Putrefaction is caused by organisms having proteolytic powers, but these organisms are accompanied in their invasion of carcases by some of the pathogenic anærobes. The best known putrefactive organism is the B. sporogenes.

These and other matters in which we must revise our pre-war ideas, and an account of the newly-discovered pathogenic anærobes will be dealt with in this paper.

The Infections dealt with.

In dealing with this subject, I want as far as possible to get away from text-book descriptions to which you all have access, and I want to avoid covering ground where you are not likely to have difficulty. For instance, the title of my paper would include infections with the bacillus of necrosis, but clinically, and on post-mortem examination, there is no difficulty and no possibility of an error in diagnosis in such conditions as so-called diphtheria in calves, bacillary necrosis of the liver, or in the many other kinds of bacillus necrosis infection in animals. Most of you are familiar, too, with the necrosis bacillus under the microscope, a long, fine, faintly-staining, non-sporulating bacillus, in especially abundant numbers at the line of demarcation between the necrotic and healthy tissues. My title would also include the bacillus of tetanus, but none of you have any difficulty in diagnosing tetanus clinically, and from a discharging wound in a case of tetanus most of you would be able to point out the tetanus bacillus, a fine bacillus with a terminal spore, in which condition it has been likened to " a pin with the point cut off."

The organisms I wish to deal with are B. chauvœi, Vibrion septique, B. welchii, B. œdematiens, and B. histolyticus, that is to say, the anærobes which have the power of invading living tissue when they get the opportunity. They are better looked upon as not truly parasitic. They possess varying powers of penetration of the body when they do get access to the tissues. They are probably to be found to some extent in the soil of every country in the world, and more especially in soils which have been manured, since some at least of these bacilli are normal inhabitants of the alimentary canal of animals. I will refer also to the toxin-producing anærobe B. botulinus, and to B. sporogenes, and the non-pathogenic anærobes

Anærobic technique.

Since anærobes only grow in the absence of oxygen, it follows that some method for excluding oxygen from the culture media during incubation must be adopted. Such methods are many and varied, simple and complicated. Given a satisfactory method of excluding oxygen, anærobic bacteria may be studied in precisely the same way as ærobes. Their colonies can be studied on the surface or in the depth of media, they may be separated out by plating on the surface or shaking up in a medium subsequently allowed to solidify, their fermentative reactions can be studied, etc., etc.

The simplest method for obtaining cultures is to use a broth medium containing something which will absorb oxygen; for example, glucose 1 per cent., sodium formate 1 per cent., or a few pieces of cooked meat, white of egg or brain at the bottom, and with or without liquid paraffin floating on the top. Such media are boiled and quickly cooled before use, and some may be incubated exposed to air, as in the case of ærobic cultures. The boiling prior to use removes the contained oxygen and the meat, brain, egg, glucose or sodium formate, as the case may be, acts as an absorbent for any oxygen which penetrates from the atmosphere. The oil on top discourages the penetration of oxygen, and perhaps better than liquid paraffin for this purpose is sterile vaselin, or a disc of solid paraffin. Pipettes have to be used to examine cultures where an oil or solid paraffin cover is used. One of the most favourable media in which to commence a growth of anærobes is a broth made from liver. It requires neither tissue in the medium nor oil on the surface, and even strict anærobes will grow in it without first boiling the medium or indeed, taking any anærobic precautions at all. In this medium, however, sporulation does not take place; the medium becomes strongly acid, and stored cultures soon die out. Cultures may be obtained without difficulty in the depth of solid media containing glucose, sodium formate, etc., and all the more readily if a good depth of medium is used. If, however, one wishes to get surface cultures in tubes or plates, one must adopt some good method to secure anærobiosis. For this purpose there are the well-known text-book methods using Buchner's tubes or Bulloch's jars, exhausting the air by means of a vacuum pump, and removing the last traces of oxygen by a mixture of caustic soda and pyrogallate of potash. Another method is to exhaust the air from a jar container and replace it by hydrogen from the well-known Kipp's apparatus, or with a liquid medium sterile hydrogen is bubbled through. Perhaps the most efficient method of securing anærobic conditions is McIntosh and Fildes' method, of which a detailed description is found in the newest works on technique. This is a method in which palladiumised asbestos is enclosed in a wire capsule inside the jar, and capable of being heated by an electric current passing through a resistance wire in the asbestos. The air in the jar is exhausted by means of a vacuum pump and replaced by hydrogen. The current is then switched on and the heated palladium asbestos causes the last traces of oxygen in the jar to unite with the contained hydrogen forming H_2O, an explosion being prevented by the wire capsule after the manner of a miner's

lamp. With some anærobes it is necessary to provide for the escape of gases formed during growth, otherwise burst flasks, bottles, or jars may result. Such escape must be provided in a manner which will not allow oxygen to enter. It can be very efficiently done by means of the mercury valve, where the escape tube for gases bends down and passes into mercury, or if an upright escape tube is used, a test tube is inverted over it, so arranged that it rests by its own weight on a trough of mercury, rising to allow escape of gas and falling to prevent entrance of oxygen. All anærobes, pathogenic or otherwise, grow well at blood heat. Media have been made from every imaginable variety of nutrient materials, all with some special object in view, tempting the growth or tempting sporulation, etc., etc.

The following are some of the media in common use for anærobes :—

Liquid media :—

Bullock's heart medium is a broth made from minced heart with some of the minced cooked meat added, and with or without an oil seal.

Horse flesh medium is the same made from horse flesh. It is also a wonderful medium in which to get heavy growths of streptococci.

Brain medium is a broth made from sheep's brains and containing some of the brain mash.

Liver broth is made from bullock's liver, without any minced liver added, and used without an oil seal.

Von Hibler's medium is a brain and liver broth with brain mash added.

Glucose or Sodium formate broth.

Coagulated egg-albumen broth is a meat broth with cubes of boiled white of egg added.

Litmus milk medium affords differential points between certain anærobes.

Solid media for surface colonies :—

Blood agar is an ordinary agar with varying amounts of sheep or rabbit blood added before solidifying.

Blood smeared agar is made by smearing a loopful of any blood over the surface of agar slopes.

Glucose agar slopes.

Serum inspissated into slopes.

Serum agar slopes.

Solid media for deep colonies :—

Serum agar.

Glucose agar with glucose in 1 per cent. or 2 per cent. amounts.

Gelatin medium with 15 to 20 per cent. gelatin.

The Bacillus Chauvœi.

Morphology.—This is a gram-positive, motile, sporulating, straight or slightly curved rod, found lying singly or in pairs, measuring 3 or 5 microns by 0·5 microns. It is seldom seen in even short chains. The oval spores lie centrally or subterminally, and are of greater diameter than the bacillus. Sporulating forms are lemon-shaped, pear-shaped, or of tennis-racquet form. Swollen forms, called navicular (boat-shaped) forms are common. In the exudate from the lesion motility is more in evidence than in young cultures. The bacillus often shows granular staining and pleomorphism. Sporulation is well seen in brain medium in twenty-four hours. On the peritoneum of animals the bacillus is found singly or in pairs with no tendency to form filaments.

Cultural Characters.—The bacillus is slow growing. It does not grow on all media. It prefers media under two weeks old. On the surface of blood agar it forms minute clear colonies quite visible to the naked eye, showing clear and shining under a low power, and watery in consistence. In deep agar containing 1 per cent. glucose it forms lenticular colonies with rays bursting from one end or from one side. It will not grow in 2 per cent. glucose in 2 per cent. agar. It grows well in liver bouillon and liver agar. In meat medium cloudiness and gas formation with a faint pink colour to the meat. Ferments: glucose, lævulose, maltose, saccharose and lactose. Does not ferment: mannite, glycerin, inulin, dextrin, and salicin. Does not grow in litmus milk, even with heavy sowing. Grows more readily in brain medium than in others, forming gas without odour, the brain tissue becoming pink. It will grow in any medium to which liver extract in saline is added. Gelatine is liquefied. It is almost non-proteolytic. It retains its virulence for years in artificial culture.

Pathogenicity.—Blackquarter is commonly understood as a disease of sheep as well as cattle caused by the B. chauvœi. It is now known, however, that not all cases of so-called blackquarter are due to the B. chauvœi, but that the Vibrion septique may also set up a lesion indistinguishable from that caused by B. chauvœi, and presenting the same bacillary appearances in stained smears. Veterinary literature contains many references to blackquarter lesions from which the supposed B. chauvœi has been isolated, but the organism described is the Vibrion septique. For example, Kitt says that blackquarter organisms from sheep give visible colonies in twelve to thirty-six hours, and the gas formed is sufficient to blow the plug out of the tube. This is sufficient to show he was not dealing with B. chauvœi, but with Vibrion septique, since the former never grows so quickly as he describes, and forms a relatively small amount of gas. There is reason to believe that some cases of "blackquarter" may be due to infection with B. œdematiens, and some are cases of mixed infection with the organisms named. It may be taken as usually true that blackquarter lesions in cattle are caused by the B. chauvœi, and those in sheep by the Vibrion septique, but cases of blackquarter due to Vibrion septique certainly occur in cattle. In Scotland, in so far as I have been able to obtain suitable material from a few cases of blackquarter in cattle, the causal organism was the B. chauvœi. Cases due to B. chauvœi certainly occur in sheep, although there is a relative insusceptibility. Marsh[4] records an undoubted case of blackquarter in sheep due to B. chauvœi. The sheep were sheared on June 12th, sick on June 13th, unable to rise on June 15th. There were four or five deaths, and there may have been more. The same writer again found B. chauvœi as the cause of blackquarter in sheep, and this was confirmed by another authority who examined Marsh's cultures. Of twenty-one strains of B.

chauvœi collected from various laboratories by Heller[5] and proved to be B. chauvœi, nineteen were from cattle and two from sheep. In natural infections with B. chauvœi in cattle, it is recognised that calves till about six months old are immune, and that susceptibility lasts from about six months to two years of age. Animals in good condition are most often attacked, males more often than females, the right side of the body more than the left, and the disease is more common in summer than in winter, probably because of the grazing season putting them in a position to become infected. Meyer states that the so-called "puerperal blackquarter" is certainly not in all cases due to anærobic infection. He further reports two cases in cattle in which liver infarcts yielded B. chauvœi, although muscle lesions of blackquarter were absent. When no wound can be found to account for infection in a case of blackquarter it is customary to asssume infection from the alimentary canal. Whether or not this is so, Leclainche and Vallée[6] have been able to show the presence of B. chauvœi in the fæces of cattle in blackquarter districts. Whether reported cases of blackquarter in horses were due to the B. chauvœi or Vibrion septique is open to doubt. Undoubtedly Foth[7] knew the distinguishing features of the two organisms, and one may, therefore, accept his reported case in a foal as being a B. chauvœi infection. So-called blackquarter in pigs has been reported, but where the bacteriology of these outbreaks has been studied they have been shewn to be Vibrion septique infections. Cattle and sheep may be artificially infected with the B. chauvœi by subcutaneous and intramuscular inoculation. Inoculation intravenously was found by Arloing, Cornevin, and Thomas[8] to infect only occasionally, producing internal, but no skeletal lesions. Leclainche and Vallée[6] showed that washed spores inoculated in large numbers will not infect. Arloing, Cornevin, and Thomas[8] failed repeatedly to infect horses, inoculation producing only a local swelling. Though Foth[7] reported an authentic natural case in a foal he was unable to produce a case in equines artificially. Of the laboratory animals guinea-pigs are best for infection with B. chauvœi. Rabbits, pigeons and white rats are very refractory, but have been infected. Mice are more resistant to infection than guinea-pigs. Subcutaneous inoculation of B. chauvœi into guinea-pigs causes a marked swelling at the seat of inoculation, and death may result on the second or third day. The post-mortem shows a hæmorrhagic exudate all over the abdominal and thoracic regions subcutaneously, with a few gas bubbles in the axillary spaces. There is no marked inflammation of the intestines or distention of them with gas. If death has been rapid, cultures from the heart blood will be sterile, but if the dead guinea-pig is kept a few hours at room temperature positive pure cultures may be obtained. Impression preparations from the peritoneal covering of the liver or any part of the peritoneal surface may show a few bacilli in ones and twos, but there is no great tendency to multiply on the serous surface, and no evidence at all of the formation of bacterial filaments there. It will be realised that it is important to be able to distinguish between a B. chauvœi infection and a Vibrion septique infection, more especially since reliable observers have been able to show that artificial immunity given against one organism confers no immunity against the other. Goss[9] found that ·1 c.c. anti-chauvœi serum protected against 25 lethal doses of B. chauvœi, but not against a single lethal dose of Vibrion septique. The blackquarter lesion as caused by B. chauvœi cannot be distinguished by the naked eye with any pretence to accuracy from that caused by the Vibrion septique. The B. chauvœi lesion is, perhaps, drier than the Vibrion septique lesion. If the carcase is opened, a slide should be pressed upon the peritoneal surface of the liver, fixed, stained and examined.

(To be continued.)

Packing of Goods for Canada.

Veterinary Certificate Question.

An order issued by the Dominion Government in August last provided that, owing to the outbreak of foot-and-mouth disease in this country, all packing consisting of straw and such-like materials sent with goods arriving in Canada must be accompanied by a certificate signed by a "veterinary officer of the Government."

Complaints were at once made to the Federation of British Industries by trades interested, particularly the pottery trade, of their difficulties in complying with this order, and the Federation took up the question with the British Ministry of Agriculture and at the same time with the Dominion Ministry of Agriculture. The latter, realizing the difficulty caused to British manufacturers, agreed that shipments containing such packing dispatched before November 15th should be admitted if accompanied by an ordinary certificate signed by a veterinary surgeon. At the same time the British Ministry of Agriculture informed the Federation that they had themselves informed the Canadian Ministry of Agriculture that no veterinary officers were maintained by the Ministry in this country, available for the signing of such certificates, on receipt of which information the Federation of British Industries suggested to the Canadian Government that they might see their way to accept certificates signed by ordinary veterinary surgeons.

This suggestion was met with a refusal on the part of the Canadian Government to depart from the provisions of the original regulation making the signature of a Government veterinary official necessary. From November 15th, therefore, a complete stoppage of consignments of British goods into Canada packed in straw or similar packing was in prospect. The Federation took up the matter once again with the Ministry of Agriculture with the result that the Ministry have agreed to nominate veterinary surgeons

in required areas as representing the Ministry, who shall be empowered to issue certificates in accordance with the requirements of the Canadian Government.—*The Times.*

The Place of the Clinician.

Following upon a recent article in the *Record*, it appears to us that the following extract from the Harveian Oration, published in the *British Medical Journal* of October 25th, is in a considerable degree *apropos* :—

" It is natural, nay inevitable, that as medical science grows and advances, some of the workers in the field should elect to follow the path which leads through the laboratory, whereas to others the wards make a stronger appeal ; and thus is taking place a differentiation of medical workers into distinct groups, and there is danger that the fission may go too far. The worker in the laboratory, wedded to his more exact methods, and distrustful of those with which the clinician is often compelled to be content, is apt to place his bedside colleague in a lower grade or caste than his own. He is apt to look too much at the disease and too little at the patient, and to forget how greatly the former is shaped by the reactions and idiosyncrasies of the latter.

" We all know that a line of treatment resting upon a strictly rational basis may be useless or even harmful in an individual case. It would be nothing short of a calamity were all the best scientific workers who enter our profession to be diverted from its clinical side to laboratory investigation, for of no walk of life is it more true than of the practice of our art that ' the multitude of the wise is the welfare of the world.' From the ranks of the clinical workers have been drawn those who, in the past, have built up medical science. It was in the intervals of their clinical practice that such men as Harvey himself, William Gilbert, Nehemiah Grew, and Thomas Young carried out the researches which have made them for ever famous ; and, indeed, clinical medicine is itself essentially scientific.

" But clinical medicine is an art as well as a science, and in the sick room many qualities are called for which are not essential in the laboratory. A man who is deeply imbued with the spirit of science may prove a very poor practitioner, whereas another, rich in common sense, sound knowledge, experience, and human sympathy, but to whom abstract science makes little appeal, may make a very good one. Tact and equanimity, courage and restraint, patience with fads and sympathy with grief, diagnostic skill and manual dexterity are qualities called for in the daily work of the practitioner of medicine or surgery. The marvel is that, on the scientific side, he has accomplished so much, not that he has failed to accomplish more. It ill becomes his colleagues in the laboratory to think slightingly of him.

" Medicine, indeed, embraces a number of constituent sciences, and for the attainment of her beneficent aims all her branches need to work together in mutual respect, amity, and concord ; to bear in mind Harvey's third injunction to that effect, and his reminder that : ' Concordia res parvæ crescunt, discordia magnæ dilabuntur.' "

The Veterinary Record.

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THE VETERINARY COLLEGES IN SCOTLAND.

In the Report which has just been issued of the Departmental Committee appointed in February of this year " to consider and advise regarding the General Finance of Agricultural Education and Research in Scotland," the question of the veterinary colleges in Scotland is dealt with.

The Report states (para. 92) that " in 1923 the Board of Agriculture for Scotland pointed out to the Governors of the Glasgow College the desirability of amalgamating with the " Dick " College, on the footing that veterinary education in Scotland would be given exclusively at the latter institution, and upon the governors refusing to entertain this suggestion it intimated that it would be unable to make any Government contribution to the funds after 31st March, 1925."

It is not the purpose of *The Veterinary Record* to take sides in any controversy there may be between the two colleges. We are not sure that there is any controversy as between the two colleges, their governing bodies, or staffs. We merely wish to review the facts.

As we see the situation, it appears that it is the Board of Agriculture for Scotland which cannot see its way to continue government grants to both colleges, unless there is any sound reason to be put forward for having two colleges in Scotland if one would suffice to meet all needs.

The Committee in its Report bears out the contention of the Board of Agriculture that there is no need for more than one college in Scotland. They argue that :—

> There are 300 practitioners in Scotland, and the wastage cannot exceed ten or twelve per annum. The wastage for the whole R.C.V.S. does not exceed 100, and there are two other colleges in England. From the point of view of numbers there is only room for one college in Scotland. The profession must remain numerically small, but as the scientific and practical training more and more approximate to those of the medical practitioner, the modern veterinary college must be well equipped, and well staffed with specialists. From the point of view of efficiency the one college should be thoroughly up to date. Two such colleges would be wasteful.

Having become convinced that only one college is necessary in Scotland, the Committee, like the Board previously, examined the condition of the respective colleges, and found :—

> That the Glasgow College is handicapped by the absence of any endowment. Its total income in 1923-24 was £4,006, of which £870 came from local authorities, and £1,130 from the Board of Agriculture. There was a sum of £2,010 for the payment of two whole-time and eight part-time professors. There is no college clinic.
>
> That the Edinburgh College is newly built at a cost of over £50,000. There is a staff of whole-time professors, and students are drawn from a wide area. The University of Edinburgh confers a degree in veterinary science.

The Committee answers the arguments of the Glasgow College governors for the continued existence of the Glasgow College as follows :—

> It seems impossible that, on its present financial basis, the Glasgow College can either improve the status of the practitioner or seriously compete with the standard of the other college.
>
> The recruiting field for veterinary students in the West would not be lost, since students there can obtain maintenance grants under the Education Act of 1918 to attend the Edinburgh College, just as some of them do now whilst attending the Glasgow College. It is obviously wrong to say that two colleges with small classes can be maintained at less cost than one college with large classes.
>
> The proposal is not to shut down one of two well-equipped educational institutions, but to shut down the one which is lacking in endowments, buildings, staff, and facilities for post-graduate training. The question is one of efficiency and national economy.

The Committee concludes that the system in vogue in Glasgow must in the end react unfavourably on the training of the student, and that, considering all the circumstances, no duty devolves upon the State to support both institutions.

The Committee's analysis of the present position of the two colleges seems to us on the whole fair and impartial. We get the impression that, had the financial, etc., conditions of the two colleges been *vice versa*, the Committee would have advocated the closing of the Edinburgh College, and the continuance of the college in Glasgow as the one college for Scotland.

There was a time when Britain supplied veterinarians to all parts of her Empire. This time has gone, never to return. India, South Africa, Egypt, Canada and Australia all train their own veterinarians now, and except for a few specialists our graduates are not likely to be wanted in those countries. This means that our colleges in Britain will in years to come be called upon to train men almost solely for England and Scotland, and a few of the smaller colonies. If British Colleges are to train fewer numbers, it is vital that they should turn out men of the highest calibre.

We have one fault to find with the Committee, in that they describe the "Dick" College as "an institution thoroughly equipped." Buildings there may be, but fittings are practically absent, and equipment does not seem to be greatly in evidence.

Unless the Glasgow College Governors can raise locally a large sum of money, which must be measured in tens of thousands of pounds, sufficient to make up for all that is lacking in Glasgow at present, and secure all the facilities required, including recognition, if not affiliation, by Glasgow University, we feel that the bulk of the profession will conclude that it would be better to have one adequately equipped and fitted college in Scotland than two colleges, each lacking in many of the essentials. The profession will conclude that the policy of concentrating whatever Government or other funds are available, upon that college which is now in the best position to profit by that help, is the policy which is in the best interests of the profession as a whole.

Will Glasgow and the West of Scotland be convinced by the arguments for continuance, and respond? The answer must come one way or the other in the near future. The best friends of the profession will hope the answer will be decisive one way or the other, since our profession is too small to put up with half measures. What training centres we have must be of the very best.

CLINICAL AND CASE REPORTS.

Anal Fistula in a Cat.

By Captain H. Kirk, M.R.C.V.S.,
Wigmore Street, W.

An interesting case, in which there were several outstanding features, has recently claimed my attention. The subject was a red Persian cat, seventeen years of age, a miserable specimen really, but a great pet.

The animal was brought to me with a history of being a glutton for fish, and having partaken of an extra portion upon the previous day, since when it had seemed in pain. A fish bone was, therefore suspected by the owner as having caused the trouble. I discovered, however, the existence of an anal fistula. Owing to the pain caused by manipulation, and likely to be inflicted by exploratory probing, etc., I suggested that the cat should be chloroformed and if necessary, an operation performed.

This was accordingly done—in spite of the great age and poor condition of the patient. On the left side of the anus was a bulging area, which became more distended when water was passed into the rectum.

An opening was thereupon made into this swelling, which released a small amount of fæcal matter and pus. A probe passed into the new hole showed that there was now a complete fistula from the skin to the rectum. The latter was blocked with several extraordinarily hard fæcal pellets, which were removed

only with great difficulty. Owing to the pain of defæcating, the cat had most probably deliberately refrained from performing this act, with the consequences that I have just described. On the right side of the anus was a sinus, very narrow in lumen, extending nearly to the rectum, and containing a tightly packed mass of inspissated pus which appeared to be almost granular.

These contents were removed with a grooved director, and the blind passage syringed out with antiseptic solution. Having cleaned out the complete fistula on the left, I then inserted a silver caustic stick to within a little of the rectum, in order to destroy the lining membrane of the canal. The cat went home next morning, apparently much easier and brighter. Three days later it returned with a large tense abscess on the right side of the anus, having no connection whatever with the original lesion on that side. The cat was chloroformed again, the abscess opened, and the left fistula re-examined. I found that quite the best method of cleaning out both the abscess cavity and the fistula was to inject a 50 per cent. solution of hydrogen peroxide (10 vol.), for the smallest injection of this fluid was immediately followed by the emission from the wound of volumes of froth carrying with it pus, fæcal matter, and any other foreign body which was removable.

Daily treatment upon these lines produced a very rapid healing, and at the time of writing (fifteen days after operation) I fancy the fistula will eventually become obliterated.

The unusual features about this case were the ease and safety with which so aged and emaciated a cat took chloroform, the comparative rarity of anal fistula in cats and, thirdly, a freak of birth peculiar to several generations. [Capt. Kirk subsequently reports that the cat has completely recovered, and the wounds have healed.—Ed.]

Hereditary Supernumerary Toes in Cats.

By Captain H. Kirk, M.R.C.V.S.,
Wigmore Street, W.

The history I was able to obtain is as follows:—Many years ago my client had a pedigree red Persian Queen, which possesssed an extra toe on each foot. She mated with a short-haired black. The kittens of the union were mostly red in colour, some short-haired and some long, but all had extra toes. One of this litter was red and black, and mated with a tabby. Most of the progeny had extra toes, and ginger colour prevailed. One of the females of this litter was served by an unknown gentleman, the cat which was the subject of the anal fistula being one of the family. This latter animal had also six toes on each fore foot and five on each hind one, and the colour was red. I think it rather remarkable that the original Queen should have exerted so strong and persistent an influence upon subsequent generations of her family, for we find that her colour and freak toes were handed quite a long way down, although the latter tended gradually to disappear.

REVIEW.

[Traite d'Anatomie Pathologique Generale, by Dr. V. Ball, Vigot Frères, Paris, 1924. pp. 514.]

It has long been felt that a study of the morbid changes which take place in the lower animals has not received the attention which it deserves. Many writers are prone to apply the classical descriptions of the pathological changes which occur in man to those which are observed in animals.

The appearance, therefore, of this book by Dr. V. Ball cannot fail to arouse interest. By virtue of his intimate knowledge of both human and veterinary pathology, he has been able to unite in one book the study of both subjects. He considers that an appreciation of comparative pathology in its broadest sense should be of assistance, both to the veterinarian and his medical confrère.

After a brief survey of the degenerations, the author passes on to a detailed exposition of the inflammations. In this chapter will be found excellent descriptions of the lesions of tuberculosis as they occur in the domestic animals; of glanders, actinomycosis and rabies. The final chapter is devoted to the study of neoplasms. The suggested causes of malignant growths are discussed in an impartial manner, and a complete resumé of experimental cancer in particular, the so-called "tar-cancers," is included.

It is perhaps inevitable that in dealing with a subject of such magnitude, there should be a few lacunæ. In particular, no mention is made of the pathological changes in the blood.

The work is plentifully illustrated with micro-photographs.

ABSTRACT.

[Contribution à l'étude des maladies cutanées du chien et du chat (contribution to the study of cutaneous diseases of the dog and cat) reported by Nilder, M. Recueil de Médicine vétérinaire. Vol. C— No. 14. 30th July, 1924, pp. 322-323..]

The memoir consists of three chapters. In the first, the various stages of evolution of dermatoses are described; congestion, infiltration or thickening, formation of folds. The author enumerates five different types of depilation viz.: normal depilation; type alopecial; type nummular; and a regular and an irregular type. Next, he enumerates the elementary signs of skin affection. The formation of papules, pustules, vesicles, erythema, scales and crusts. The character of the crusts, particularly, serves as an indication of the severity of the pruritus.

In the second chapter, the three essential dermatoses of the dog are described. These are: demodectic mange, sarcoptic mange, and eczema. With regard to the first condition, the pathognomonic indication is the appearance of a swarthy, deep-red stain. The stain disappears under pressure of a finger, but re-appears immediately after pressure ceases. The condition is compared to "a copper saucepan badly

polished." The demodex is commonly found in these areas. Dogs more than two years old are rarely affected; and animals in poor condition do not show signs of pruritus till their physical condition improves. Demodectic mange is often cured spontaneously. The parasite, apparently, does not like to be hustled about.

Sarcoptic mange is characterised by the frenzied manner with which the patient scratches itself. The surface of the body is covered by crusts formed of dessicated blood, and presenting various appearances. Between the crusts the skin may be perfectly healthy. Aggregations of sand-like particles occur round the conchal cartilage. These areas are probably caused by the desiccation of plasma exuded from vesicules. The evolution of this variety of mange is habitually rapid. Within a month generalised skin lesions can form. If the dog is well cared for and in good condition, the development of the disease is greatly retarded.

With regard to eczematous diathesis, the numerous types of eczema are clearly differentiated. The types comprise: papular eczema, nodular eczema, papular squamous, eczema of misery, squamous and lamellar. Eczema is not pruriginous when the affection is long established, squamous and hard.

In chapter three, the skin affections of the cat are considered. These are three in number, viz.: notœdric and otodectic mange and eczema. Notœdric mange is characterised by the predilection of the affection for the summit of the head, its contagiousness for man, and the absence of pruritus. It spreads rapidly, and yields readily to treatment with lukewarm creaglated oil, 1 in 20. The otodectic variety is distinguished by intense itchiness. It is more common than notœdric mange, and is usually spread over the whole surface of the body. "The sign of the curette" is a certain means of diagnosis.

Three forms of eczema occur in the cat. (1) Erythematous or humid eczema, which is localised on the ventral surface, the groins and thighs. (2) Eczema simplex, affecting the back, the loins, and the root of the tail. (3) Eczema pityroid, which accompanies digestive disorders, and is remarkable for the absence of depilation of hairs. Treatment of all forms of eczema in the cat is the same, and consists in prescribing a severe diet, and avoiding dressings with either fatty or aqueous bases. A 1 per cent. sol. in alcohol of picric acid or silver nitrate is usually efficacious.

Royal College of Veterinary Surgeons.

OBITUARY.

WILLIAMS, S. J., 13 Holbein Place, S.W.1. Graduated London, December 19th, 1889. Died 10th November, 1924.

GOODERSON, F. R. P., Burnham Market, Norfolk. Graduated London, December 16th, 1886. Died 10th November, 1924.

CATMUR, M. G., The Vineyard, Abingdon, Berks. Graduated London, July 13th, 1923. Died 8th November, 1924.

VERNEY, RICHARD JOHN, Oxford. Graduated London, 31st March, 1875. Died 17th November, 1924.

DIVISIONAL REPORTS.

Eastern Counties Division.*

AUTUMN MEETING AT YARMOUTH.

The autumn meeting of the Eastern Counties Division was held on Friday, October 10th, at the Star Hotel, Yarmouth. The President, Col. W. A. Wood (Cambridge), occupied the chair, and the members present were: Messrs. H. Wilkinson (Martham), W. H. Wortley (Bungay), R. E. Glover (Cambridge), T. G. Heatley (Woodbridge), H. F. Low (Norwich), H. P. Standley (Norwich), P. R. Turner (Bury St. Edmunds), J. F. Thurston (Fressingfield), J. M. Currie (Lowestoft), and W. Shipley, Hon. Sec. (Yarmouth). Mr. G. H. Livesey, Secretary of the National Veterinary Association, who is an honorary associate, also attended.

The SECRETARY read a letter from Mr. Dunlop Martin (Westcliff), resigning his membership as, owing to the distance, he found it impossible to attend the Society's meetings. The resignation was accepted with regret.

The National Veterinary Association forwarded a resolution from the Western Counties Division stating that in the opinion of their members, the time has arrived when veterinary surgeons should be paid an adequate fee for their attendance at dog shows.

Mr. TURNER proposed that whole-hearted support be given to this resolution.

Mr. LOW seconded.

Mr. CURRIE said that if a fee was charged for attending dog shows they should also charge for attending agricultural shows, and put them all on the same basis.

Mr. LOW thought veterinary surgeons who attended agricultural shows received fees.

Mr. STANDLEY said he was paid for attending the Suffolk Show, but he always remitted the fee in favour of the Society. He received a four-guinea fee, and it was the only local show he attended. There was a little show of toy dogs at Norwich, but it had no funds from which to pay veterinary surgeons. The principle of the resolution was right and they ought to be paid.

Mr. TURNER said that shows of sleeve dogs were run by rich people. If the resolution was carried other shows would fall into line. When he went to Bury and Ipswich he got nothing at all for his attendance.

Mr. STANDLEY expressed the opinion that Mr. Turner had only himself to thank for that.

Mr. TURNER remarked that because they had done it in the past that was no reason why they should always do it in future.

Mr. LIVESEY said there had been a little trouble over agricultural shows in South Wales, where the veterinary surgeons did not want to act for agricultural shows unless they had some recognition, such as honorary membership. They tendered their resigna-

*Received on October 15th.

tions in a body to the Agricultural Show Committee, and asked to be made honorary members. The show committee refused this at first, afterwards there was some discussion, with the result all were made honorary members. The matter was satisfactorily settled, and had established a precedent. If veterinary surgeons would act in the same way in regard to dog shows they would get all they wanted. If veterinary surgeons objected to quack remedies being offered at dog shows they should refuse to act. In 1902 or 1903, the veterinary surgeons in the southern part of Sussex decided to have nothing to do with dog shows unless advertisements of patent medicines were excluded from the catalogue, and they got their way.

Mr. CURRIE stated that patent medicines were shown and advertised at agricultural shows more than at dog shows.

The PRESIDENT said they ought to support the Western Counties' resolution because, if a veterinary surgeon attended a show, he should be paid for his services, but it had not been done for a long time. The question of quack medicines raised a large subject, and it was best to deal with the matter of attendance at dog shows only for the present.

Mr. LOW thought some scale of fees should be fixed. It was no use for one individual to charge 5s., and another to ask two guineas.

Mr. SHIPLEY said this would probably be settled by the National Association.

The resolution was then carried.

It was proposed by Mr. STANDLEY and seconded by Mr. CURRIE that the annual meeting in February be held at Norwich. This was agreed to.

Mr. LIVESEY, on the invitation of the President, next addressed the meeting. He took that opportunity he said, to thank the members for electing him an honorary associate. It was an honour which he greatly appreciated, as it was a gracious recognition that helped and encouraged him in his work. The National Association was now in a very strong position, and the first steps had been taken toward what he hoped would be a most prosperous career. Next year the Association would enter upon a new phase. They were winding up the present company in order to get rid of the word Limited, and become incorporated. They would start with a completely new set of articles of association, and memorandum of association. These had been very much enlarged in scope because the activities of the "National" would be greatly extended in future. The colonial associations had put out feelers and asked what possibility there was of affiliation. Only a few days ago the Hon. John Smith, Chief Veterinary Officer of Northern Rhodesia, came to see him. He was appointed not very long since to the Legislative Council of Northern Rhodesia. There was to be a Veterinary Surgeons' Act, which would probably be framed on the lines of the present Act going through for New South Wales, setting up a Veterinary Board which would grant licences to men to practise in the colony the art and science of veterinary surgery and medicine if they were qualified by holding one of the specified degrees. That Veterinary Board would be composed largely of members of the Rhodesian Veterinary Association, and Mr. Smith told him that as soon as he got back to Rhodesia one of his first acts would be to apply for the affiliation of that Association with the "National." The same thing would happen in regard to other colonies and protectorates, whose names he was not at liberty to mention at present. If the veterinary associations of the colonies were to be affiliated with the "National" it would take a very much more important position throughout the world than it had yet held, and a very great responsibility would attach to the proceedings of its Council. If the "National" was to do the work it had set out to do, and do it effectively, it must speak with the voice of the whole profession. They must get an increased membership, so as to have more power, and the Council must consist of men who knew the requirements and necessities, the wishes and opinions of veterinary surgeons in all parts of the country, and not necessarily of those who were principally concerned with practice in and around London. It would become more and more incumbent upon the Divisions to send up representatives to take their part in forming the policy of the National Association. For small associations the difficulty of railway fares had to be taken into consideration. It bore rather hardly on those delegated to speak for them that they should have to pay their fares out of their own pockets, and attend the Council at their own expense. It was also difficult to leave a small practice, where one was single-handed, for a whole day and perhaps two days. Last year there were more than forty Council and Committee meetings, and as most of the work was done in Committee it meant a frequent attendance in London. He hoped it would be possible for their representatives regularly to attend the Council. During this year, Mr. Roberts had come as often as his health permitted. Apart from his attendance, there was no indication from Norfolk, Suffolk, and Essex what their wishes were. They were inarticulate unless they made their views heard. Their representatives should be at the Council to help and guide it. All the divisions should make that effort not merely for the National Association, but for the good of the profession. During the last twelve months the membership of the N.V.M.A. had been increased by 200, and they now had funds in reserve. When they had a little more they could talk with a louder voice, but they must have funds at their disposal. When the profession was united in one organisation, through the divisions, they would get some measure of what they wanted. They were working very hard to get the re-introduction of the Tuberculosis Order, and the control of tuberculin which, he believed, would eventually come. They were also working very hard to improve the pay and conditions of men serving under Government. A great deal of work was done on the Appointments Committee towards this end. So far as the Ministry of Agriculture was concerned, it was necessary to get the initial salary raised, because all Government servants could only get increases of pay at the rate of £15 per annum. It was impossible to alter the yearly rate of

increment, because it affected the whole civil service. By getting the initial pay raised, with the increment of £15 per annum, they secured that a man at 40 to 45 would have a salary on which he would be able to educate his son as a veterinary surgeon. At present it was practically impossible for a man in the Ministry of Agriculture to bring up his son as a professional man. They had also worked very strenuously to obtain a better and more uniform rate of payment for part-time, and whole-time veterinary inspectors. He circularised all the divisions and asked the inspectors to meet and agree upon fees suitable for their districts. So far he had received an acknowledgement from Mr. Shipley their Secretary, and this was the only reply he had received. Mr. Shipley did not tell him what had been done, but he was going to write him later. He hoped they would all do what they could to help headquarters, to get the profession united, and get something done. They had been talking about it for a long time, and now they were in a position to get it if only the members would deal with this matter in a firm and prompt manner.

Mr. SHIPLEY said he had learned from Mr. Livesey that their Society was entitled to two members on the Council of the "National" in addition to the Secretary. Up to the present they had only had one representative in Mr. Roberts, of Ipswich. He therefore proposed the election of Colonel Wood as another representative.

Mr. HEATLEY seconded and this was carried unanimously.

Colonel WOOD thanked the members, and said that as the next meeting of the "National" was to be at Cambridge, there would be some work to be done by the division as it came within their area.

The Secretary, Mr. W. SHIPLEY, presented a paper on Contagious Bovine Abortion and Sterility and its Control, from the point of view of a country practitioner.

The paper promoted a good discussion.

(Mr. Shipley's paper, together with discussion, are published elsewhere in this issue.—ED.).

A vote of thanks to the President brought the meeting to a close, several members remaining to take tea together before separating.

W. SHIPLEY,
Hon. Secretary.

Derbyshire Division.*

A meeting of the Division was held at the Royal Hotel, Derby, on October 21st, 1924. The President (Mr. J. C. Deville) presided, and there were also present Mr. W. F. Aston, Major T. V. Bagshaw, Mr. J. C. Heather, and the Hon. Secretary (Captain O. V. Gunning).

The minutes of last meeting were taken as read. Letters of regret for inability to attend were received from Messrs. P. M. Evershed, Nottingham; J. Green, Nottingham; E. Marrison, Bakewell; and E. T. Prince, Ashbourne.

*Received on November 3rd.

A letter was also read from Miss Briggs, saying that her father had met with a serious motor cycle accident, and was in Nottingham Hospital suffering from head injuries and a compound fracture of the leg. The Hon. Secretary was instructed to write to Mr. Briggs conveying to him the sympathy of the members present, and wishing him a speedy recovery to health.

A letter was received from Mr. R. S. White, Castle Donington, resigning from the Association. As it was understood that Mr. White was leaving the district, his resignation was accepted with regret.

A letter from the Secretary of the Victoria Veterinary Benevolent Fund was read, asking for a renewal of the Association's subscription to the fund, stating that there had been exceptionally heavy calls on the fund this year. It was agreed to let the letter stand on the table until the next meeting, in order that the financial position of the Association could be ascertained.

Two letters were read from the General Secretary N.V.M.A., and from the Western Counties Division respectively, asking for the consideration of a resolution passed by the Western Counties Association: "That the time has arrived when Veterinary Surgeons should be paid an adequate fee for their services at Dog Shows." It was proposed by Mr. HEATHER and seconded by Mr. ASTON that a resolution be passed similar to that proposed by the Western Counties Division. This was carried unanimously.

It was proposed by Major BAGSHAW and seconded by Mr. ASTON that the accounts be held over until the next meeting.

The Secretary of the Lancashire Veterinary Association had written stating that Sir Stewart Stockman had kindly consented to attend and read a paper in the last week of November, and the Council of that Association resolved to invite the Yorkshire V.M.A., the North Midland V.M.A., and the Derbyshire V.M.A., to join with the Lancashire V.M.A., and hold a combined meeting on a date most convenient to the lecturer.

On the proposition of Mr. ASTON, seconded by Major BAGSHAW, it was resolved that the invitation should be accepted, and it was left to the Hon. Secretary to make the necessary arrangements.

The subject of fees paid to Veterinary Inspectors was then discussed. A letter was read from the General Secretary, asking that Divisions should enquire into the matter and agree to a satisfactory scale, take the matter up with their local authorities, and forward their results to the General Secretary. The Hon. Secretary pointed out that this letter had arrived almost immediately after their last quarterly meeting, and, after taking the matter up with the President, it was thought inadvisable to call another meeting so soon. He (the Hon. Secretary) had therefore written to as many individual members as he could in order to have as far as possible the feeling of the division on the matter, in case he was called upon for a reply. In every case he had found that the member approached thought it inadvisable to approach

the County Council further in the matter, as a substantial rise had recently been made by the D.C.C.

It was proposed by Mr. HEATHER and seconded by Mr. ASTON, and carried unanimously that the Hon. Secretary should write to the General Secretary, stating that "as the fees of the Veterinary Inspectors to the County Council have just been raised, it is the opinion of this meeting that it will be inadvisable to approach the County Council locally. Any further attempt to raise the fees must come from the National."

ELECTION OF OFFICERS FOR 1925.

The PRESIDENT in proposing Mr. Prince as President for the year 1925, stated that the latter was an old member of the Association, and assisted when the Association was first started, and became the first Secretary. It was, therefore, with much pleasure that he proposed him. The motion was seconded by Mr. HEATHER, who said Mr. Prince was a very good friend of the Association, and they could not wish for a better man.

The following officers were elected:—

President, Mr. F. T. Prince; *Vice-Presidents*, Mr. J. C. Deville, Mr. E. Marrison (to become President 1926); *Hon. Secretary*, Captain O. V. Gunning; *Hon. Treasurer*, Major T. V. Bagshaw; *Hon. Auditors*, Messrs. A. Levie and W. F. Aston; *Council*, Messrs. Aston, Briggs, Farrer, McIntyre, Heather, and officers of Association; *Representatives to Council, N.V.M.A.*, President and Secretary.

It was resolved to discuss the representatives to Council again at the next meeting.

It had been arranged for Major T. V. Bagshaw to read a paper on an unusual case of septicæmia, but owing to the smallness of the attendance the reading of the paper was, in fairness to Major Bagshaw, postponed until the next meeting.

At the conclusion of the meeting, the HON. SECRETARY said he would like to propose the vote of thanks to the retiring President. Mr. Deville had taken a keen interest in the work of the Association, and he personally had received endless kindness and assistance from him during his term of office, which had made his duties a real pleasure.

Mr. HEATHER in seconding, said he would not only like to endorse all the Hon. Secretary had said, but he would like to go further and say they had something to learn from every President, and Mr. Deville had shown them how to conduct the meetings promptly, as the programme had always been finished punctually.

The PRESIDENT, in replying, thanked the members for the support they had given him. All meetings had been well attended, there had been some good discussions, and a live interest taken in the proceedings. It had been a very pleasant year of office.

After the meeting the members took tea together, and although the attendance was small, many items of interest were discussed, and the interest taken was evidenced by the reluctance of the party to break up.

O. V. GUNNING,
Hon. Secretary.

NOTES AND NEWS.

The Editor will be glad to receive items of professional interest in these columns.

Diary of Events.

Nov. 26th—Meeting of the Scottish Metropolitan Division at Edinburgh.

Nov. 28th—Meeting of the Royal Counties Division at 10 Red Lion Square, W.C.

Nov. 28th } R.C.V.S. Written Examination for
Nov. 29th } D.V.S.M.

Dec. 1st—4th—Oral and Practical D.V.S.M. Examination Edinburgh and London.

Dec. 8th—R.C.V.S. Written Examinations—Membership Diploma.

General Meeting of the Association for the purpose of voluntary liquidation.

Dec. 11th—R.C.V.S. Oral Examinations commence in Dublin.

Dec. 23rd—Confirmatory General Meeting of the Association.

The Provisional Committee held its first meeting at Cambridge on Thursday, the 13th inst., when there was a good attendance of those who had been nominated. Professor J. B. Buxton was unanimously voted to the chair, and Colonel W. A. Wood was elected local secretary.

* * * *

A large number of subjects was brought up for discussion and amongst these was the date on which the next Congress is to be held. It is necessary that this should be settled at the earliest possible moment, in order to adapt the arrangements so far as possible with the University authorities at Cambridge. At present it seems probable that the date chosen will be about the third week in August. Many suggestions were made regarding papers and other subjects for discussion, and an executive committee was appointed to go into all these matters and report upon them to the next meeting.

* * * *

It is hoped next year to arrange a more attractive programme for the Veterinary Inspectors' Section. Last year's meetings were more or less in the nature of an experiment. Next year we shall at least, have the benefit of a little experience, and of the suggestions for the development of the Section, which we hope members will not hesitate to send to us. The Section ought to be of the very greatest value and no such opportunity should be lost of getting inspectors together to discuss the multitude of topics which concern them so closely.

* * * *

We congratulate Mr. F. C. Scott on his appointment as Hon. Secretary of the Yorkshire Division. In following Mr. Clarkson he is inviting criticism. But,

excellent as was Mr. Clarkson in his capacity as Secretary, we believe that Mr. Scott will "make good" and keep up the traditions of this fine old Society. We hope he will do his best to strengthen the bonds between the "Yorkshire" and the "National," on the Council of which he is sure of a welcome.

* * * *

At a meeting of the Surrey Branch of the British Medical Association held at the Surbiton Hospital on November 11th, 1924, at which a Lecture was given by Major F. T. G. Hobday on "The value of Collaboration between the Medical and Veterinary Professions for the Eradication of Anthrax and Tuberculosis," the following Resolution (which was originally brought forward in March, 1922, at a combined Meeting of the Royal Society of Medicine and the Central Veterinary Society by Sir John M'Fadyean) was unanimously passed:—

"That the prevalence of Tuberulocis in cattle in this country continues to be a serious menace to the health of human beings, and that to counteract this danger, the re-introduction of the Animals' Tuberculosis Order, which was suspended in 1914, is urgently needed."

The Resolution was proposed by Dr. Carver, of Surbition, and seconded by Dr. Goodman, of Kingston, being passed without a dissentient voice.

We hope that there will be a good muster of R.A.V.C. "Old Comrades" at the Association Dinner, which is to be held on Friday next, at Anderton's Hotel, Fleet Street. The Committee request the attendance of all available past and present members of the Corps at the Annual Meeting at 5-30.

Tattooing Large Black Pigs.

The Scientific Research Committee of the Large Black Pig Society, has devoted considerable attention to the question of the tattooing of large black pigs. At the present time, there are two systems of marking black pigs, namely, by means of notching the ear, or by the insertion of ribbons containing numbers. Neither of these systems is quite satisfactory, as they do not provide any guarantee against dishonesty, such as would be obtained if a proper tattooing system could be devised. It is quite simple to tattoo white pigs; but with regard to black pigs the difficulty arises from the colour. Tattooing or marking is always carried out in the ears, and what the Large Black Pig Society particularly want is a tattooing ink which can be applied by ordinary tattooing instruments and which will leave a permanent record in the ear.

The Scientific Committee of the Large Black Pig Society have recommended that substantial prizes should be offered to competitors who submit any scheme for the tattooing of large black pigs, which will have the particular characteristic desired by the Society, namely, permanency.

Particulars of the competition may be obtained from the Secretary of the Large Black Pig Society, 12 Hanover Square, London.

The Warble Pest in Cattle.

For many years past, butchers and tanners have been agitating for official action to prevent the huge losses caused by the action of the warble fly in cattle. Thousands of hides are annually damaged by warble holes in the prime parts, whilst warbled meat is another fruitful source of loss to the butcher, to say nothing of the pain inflicted on cattle by this pernicious maggot. The matter was again brought into prominence at the recent meeting of the Scottish Federation of Meat Traders, when the chairman referred to the interest taken by the Government, since the war, in agriculture. He thought the time had come for legislation to extirpate the warble fly in cattle, as he considered it was the cause of an annual loss of about four million pounds to the community. He held that farmers should be compelled to treat cattle for the warble fly, just as they had been forced to do in the case of sheep scab. The difficulty in finding the right preparation had been overcome, but they were told its application would mean an increase in officials to see that its application was enforced. During the conference an interesting letter was read from the manager of the Danish Hide Association in which it was stated that for upwards of twenty-five years efforts had been made to interest Danish peasants in the warble question without result. Four years ago, however, the Danish Parliament passed an Act making it compulsory on the part of owners to treat their cattle, and statistics showed that in four years Denmark was practically free from warbles. In September, 1920, the proportion of infected cattle was 16½ per cent., whilst in September, 1924, this had fallen to 2½ per cent. One member of the federation stated that he had experimented on a herd of fifty-three cows, and that he found not a single beast was infected with the warble maggot. The feeling was general that the time was now opportune to press upon Parliament the necessity for legislation, and a resolution was carried to this effect.—*The Economist.*

CORRESPONDENCE.

Letters to the Editor should reach the Office not later than by the first post on Tuesday morning for insertion in following Saturday's issue.

All correspondence must bear the name and address of the contributor for publication.

The Editor does not hold himself responsible for the opinions of his correspondents.

Parasitology and the Veterinary Curriculum.

To the Editor of The Veterinary Record.

Sir,—My attention has been directed to the editorial on the above subject in your issue of November 1st. I have also read the excellently worded reply of Professor Craig, of Dublin, with which I heartily agree in that his disclaimer would apply almost literally to the importance attached to the subject of parasitology in the Royal Veterinary College.

It is not my desire in any way to minimise the importance of a sound working knowledge of parasitology to veterinary surgeons. I at once acknowledge that it is of great import-

ance from a clinical point of view. So much so, indeed, that at least one-third of the time occupied in the final year's course at this institution is the subject of Veterinary Medicine, with which parasitology is linked, is devoted to the study of animal parasites and diseased conditions caused by them. The rest of the course is devoted to the study of the clinical aspects of the large array of contagious diseases of the domesticated animals, the so-called constitutional diseases and the numerous local diseases affecting organs and tissues of the body. Indeed, in looking through this list, I feel that the large group of non-parasitic diseases is, as a whole, more than twice as important from a practitioner's point of view than the so-called parasitic diseases, a view strongly confirmed by examining one's case book.

I would ask if there is any possible sense of truth or justice in an article such as the Editorial in question, which would inevitably produce the impression in the mind of any intelligent member of another profession who might read it that the important subject of parasitology was almost, if not completely, ignored in the curriculum of the veterinary colleges of this country other than the exceptions quoted, when, as I have pointed out, such a large proportion of the final year's course is devoted to it. I should be one of the first to admit that such a course cannot possibly make an expert parasitologist, but I do claim that it affords a student a good working basis of parasitic diseases from the clinical or practical aspect, on which he can build as his experience grows.

I have nothing to say to Professor Nuttall's and Professor Leiper's views as relating to the medical curriculum. They are emenient scientists who know what they are writing about. But it is difficult to follow the mental workings of the writer of the Editorial in question, who immediately applies it to an entirely different curriculum, and says in effect: "the same to you and more so."—Yours faithfully, GEO. H. WOOLDRIDGE.

Royal Veterinary College,
London,
15*th November*, 1924.

The Return of the Horse.

TO THE EDITOR OF THE VETERINARY RECORD.

Sir,—You may be interested to read the enclosed cutting from the *Pimlico News*. This decision of the Westminster City Council to buy more horses and maintain the strength of their stud, is entirely owing to the representations made by my father to the Highways Committee. If we could get other Councils and firms to follow suit, it would be a step in the right direction.—Yours faithfully, HAMILTON KIRK.

67 Wigmore Street, W. 1.
11*th November*, 1924.

Our correspondent's enclosure is as follows:—

"Reporting on the question as to the desirability of continuing the use of horses, the Highways Committee of the Westminster City Council state that they believe there has been some modification of public opinion as to whether the employment of motor traction for every kind of transport is economical. 'For our part,' the Committee proceeds, 'we believe that much of the Council's work can be done more cheaply by horses than by motor lorries, particularly such work as house to house collection of refuse in areas which are only a short distance from the shoot. We think the Council will be well advised to maintain a certain number of horses for such part of their work as can be more economically done by horses than by motors. We propose that the stud of horses shall be maintained at forty-eight—a number which can be conveniently housed in the modern well-built stables at the Monck Street Depôt, under the existing horse-keeper there. . . .

"When the matter was discussed at the meeting of the City Council recently, Mr. G. Williams Smith bluntly said that he did not at all agree with the views of the Highways Committee, contending that motor traction effected a saving of 33 per cent. He was very emphatic in his observations, but when he referred to the comparatively small obstruction caused by motor vehicles, Major-General Lord Cheylesmore adroitly turned the tables and raised a loud laugh by saying: 'I am not so sure about that; recently I saw a motor vehicle which was overturned in Brompton Road, and which obstructed the roadway for hours.' Finally the Council agreed to reduce the stud of horses to forty-two, instead of the forty-eight suggested, so that it will only be necessary to purchase nine instead of fifteen new horses. Another tit-bit, by way of a rejoinder, was: 'Horses last longer than motor lorries.' The matter is to be brought up again six months hence."

Approaching Parliamentarians.

TO THE EDITOR OF THE VETERINARY RECORD.

Sir,—Mr. Wallace Kerr and myself attended Mr.Cash's meeting at Saffron Walden. Mr. Cash was standing for the Labour Party. Mr. Kerr asked him if he was in favour of the re-introduction of the Tuberculosis Order of 1914.

The prospective candidate answered in the affirmative, and went on to inform the meeting, in a few words, concerning the Order, and comparing our activities in this direction adversely with those in America. It was gratifying to know that he evidently had taken more than a little interest in the matter.

Mr. Cash, who stood for one of the Essex Divisions, was defeated by the Conservative candidate, the division being one of the strongholds of the latter party. J. MALCOLM ARMFIELD, Tanganyika Territory (on leave).

Garth Steading,
Chipstead, Surrey,
12*th November*, 1924.

The Editor acknowledges the receipt of the following:—

Communications from Messrs. H. W. Carbury, F. T. Harvey, W. Robb and S. Smith.

National Veterinary Medical Association of Great Britain and Ireland, Limited.

EDITORIAL OFFICE: 10 Gray's Inn Square, London W.C.1.

Cheques should be made payable and all communications sent to the General Secretary at the Offices of the Association, 10 Gray's Inn Square, London, W.C.1.